A STATISTICAL STUDY ON MEASURING UNDOCUMENTED MIGRATION

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Nandigram
Dantan
Egra
Khajuri
Contai
New Digha
LEGEND
International Boundary
State/UT Boundary
District Boundary
State/UT Capital
District Headquarter
National Highway
State Highway
Major Road
Railway
River/Lakes
City/Town
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ABSTRACT

When a person shifts his residence from one political or administrative boundary to another, it is known as "**Migration**." **Undocumented cross-border migration** is an active agent of the state indeed. The inflow single-handedly affects the state policies and bilateral relations with the source country. The very basis of division of India on religious line was the main cause for the migration from Bangladesh into India. It also means that the Bangladeshi Hindus felt insecure in a Muslim dominated country of Bangladesh (or East Pakistan). Common Bengali language, culture and religion were stronger forces for migration to West Bengal. This project aims to develop and apply statistical models to estimate the scale of Undocumented Migration from Bangladesh to West Bengal. The goal is to provide reliable estimates that can contribute deeper understandings of migration dynamics in different region. This study employs multi methods of statistical approach, combining an indirect method of estimation techniques. We have collected the Primary data from Census years, Volume of Census of India, Registrar General Of India, New Delhi. The introductory section is followed by the study in change on pattern of district-wise migration over decades based on decennial growth rate. The analytical work shows a strong correlation between migration rates for different years. Some analytical framework and diagram (Bar chart) involved in that study. We have used balancing equation to compute undocumented migration for corresponding years for different districts. We have shown some diagram to compare between district on undocumented migration values for different years. The application of these statistical methods indicates a substantial number of undocumented, migrants from Bangladesh residing in West Bengal. Sensitivity analysis suggests that where the number vary, the trend of increasing undocumented migration in different districts and where the number consistent for different years. The study demonstrates the feasibility and importance of using statistical methods to estimate **Undocumented Migration.**

SECTION 1: INTRODUCTION TO THE PROJECT

1.1 INTRODUCTION:

Migration is, first and foremost, a normal human activity. Human beings have always moved from one country, locality, and place of residence to settle in another. Basically, the phenomenon of migration is experienced by the human race for ages. History has witnessed massive movements of people over great distances to hunt, fish, establish a livelihood, and to find a secure home. People migrate between regions, cities and town and also migrate between countries.

However, it become a cause of concern only since the beginning of the nineteenth century. In general, international migration flows are found to be from undeveloped (basically poor) to richer countries. The volume of migration within the developing world i.e from some developing countries has become increasingly significant among the patterns of Third world population mobility.

Some major flows of people are:

The partition in 1947 caused large scale loss of life and an unprecedented migration between the two dominions. It is thought that between 14 million and 18 million people moved, and perhaps more.

During the Bangladesh liberation war with West Pakistan, an estimated 10 million people of East-Pakistan (Bangladesh) fled the country and took refuge in India particularly in the Indian states of West Bengal.

The unwanted population flow from Bangladesh to Assam in India and the two-way flow between Nepal and India.

1.2 MIGRATION:

'MOBILITY' as used in demography, refers to geographic movement whereas, in sociology, it usually refers to a change in status, e.g of occupation.

'Human mobility' is driven by diverse factors including conflict and instability, environmental degradation and climate change, poverty, marginalization and poor governance. These drivers co-exist with a number of conditions and enabling factors that determine where and how individuals chose to move. Two different types of mobility are physical mobility and social mobility. Physical mobility refers to the ability to move or travel from one place to another, while social mobility refers to the ability to move up or down the social and economic ladder within a society. Mobility refers to the movement over socio-economic categories and in particular when we concentrate on geographical movement of individuals over different states or countries then the so called movement becomes '**Migration'**.

Migration is an integral part of human history. Human beings have been moving from place to place for social, economic, or political reasons from their earliest days. Migration can be in the form of immigration, which is described as the number of people entering a receiving area, or emigration, which refers to the flow of people from a country over a given period of time. Moreover, there are two types of migration: internal, when migrants move within their country; and international migration, a situation in which migrants live outside of their country of birth for at least one year.

Most voluntary migration, whether internal or external, is undertaken in search of better economic opportunities or housing. Forced migrations usually involve people who have been expelled by governments

during war or other political upheavals or who have been forcibly transported as slaves or prisoners. Intermediate between these two categories are the voluntary migrations of refugees fleeing war, famine, or natural disasters.

1.3 UNDOCUMENTED MIGRATION:

People migrate from one place to another due to several reasons. But only a part of the total movement is documented through immigration offices. **'Undocumented migration'** is an inherent effect of any type of restrictive immigration policy. **Undocumented immigration** is the migration of people into a country in violation of that country's immigration laws, or the continuous residence in a country without the legal right to or **unauthorized**. **Undocumented immigration** tends to be financially upward, from poorer to richer countries.

Countries like India, United states are heavily affected by undocumented migration due to having less developed neighboring countries. The partition of Bengal at the time of Independence of India has created lots of problems among the population on both sides of the border. The numbers of illegal migrants into West Bengal have actually created an alarming situation in India. There have been debates whether this cross-border migration should be left totally in the hands of the states or should the society take responsibility in deciding the status of such movement. There also arise questions whether these migrants should be regarded as refuges or as illegal migrants or as politically naturalized citizens. This problem has attracted serious political attention in West Bengal in the recent years, especially, during the time of election to State Assembly held in 2006. At present many people from Bangladesh are regularly trying to infiltrate in different districts of West Bengal having borders with Bangladesh.

1.4 MAIN CAUSES OF UNDOCUMENTED MIGRATION FROM BANGLADESH TO WEST BENGAL:

The Bangladeshi immigration in India is one of the persistent problems that have emerged time and again as a major national security issue in terms of inland security and also to a large extent a demographic problem.

In the light of the objectives set in study and the existing theories on International Migration the following propositions have been formulated for verification in this study:

A. **War and partition:** Understandably, the first and foremost reason for the cross-border migration from Bangladesh to India, particularly to West Bengal is the partition of India in 1947.

B. **Relation:** Mainly, Indo (West Bengal)-Bangladesh border is prompted by historical and social affinities. 'Kin and friend relationship' actually propels the migration and helps migrants in the choice of their places of settlement.

C. **Economical**: Economic opportunity has been the time mover of migration from Bangladesh. India is more developed and economical well than Bangladesh, so it is easy to find jobs or work any field like domestic, agricultural, labour work etc.

D. **Community**: Feeling of insecurity of the minority community in Bangladesh due to rise of religious fundamentalism and frequent environmental disasters have acted as major push factors for massive migration in the wake of partition.

E. **Environment and Cultural similarities:** West Bengal and East Bengal (now Bangladesh) share historical, cultural, and linguistic similarities due to their shared history as part of the Bengal region. Both regions have a predominantly Bengali-speaking population and have been influenced by similar cultural traditions, including literature, music, and cuisine. West Bengal and Bangladesh shares 2217 km border. Interestingly, people on both sides live closer to the border and as the border runs through the jungle, hills, riverine villages, and paddy and jute fields making it trouble –free to cross.

F. Political support, ethnic affinity and sympathy of the government of West Bengal towards immigrants gave encouraged the continuance of migration.

G. The fellow feeling among the migrant community has helped the migrants to acquire citizenship rights through the acquisition of permanent documents like ration card, voter's identity card etc.

H. The Hindu immigrants consider India as their savior as well as their ultimate asylum for settlement and consider India as motherland.

1.5 MOTIVATIONS BEHIND THE STUDY:-

Some of major flows of people in South Asia which still has left bitter memories in the minds of people has been experienced by India, one of them the flight of almost **10 million from East Pakistan (Bangladesh) to India during 1971 Indo-Pak war**.

India shares **4096.7 kilometer (2,545 mile)** of its land border with Bangladesh the longest among all its neighbours, the fifth-longest land border in the world. Of these four North-East states- **Tripura account 856 km, Meghalaya 443 km, Mizoram 318 km and Assam 263 km** while West Bengal has a border running **2216.70 km** along Bangladesh**. According to Census 2011 report on migration**(D-series) around **5.5 million** people in India had reported their last residence outside the country which is roughly **0.44 per cent** of its total population. Of these, **2.3 million (42 per cent)** came from Bangladesh and **0.7 million (12.7 per cent)** from Pakistan and .**59 million (15.1 per cent) from Nepal and around 1 lakh people from Sri Lanka.** Thus, the movement of the population from Bangladesh to India is not unique, as India has been receiving migrants from other countries also**. According to census 2011, report on migration (D- series) shows that more than 20.9 lakh persons in the state of West Bengal were born in other Asian Countries out of which more than 82 per cent were from Bangladesh.**

Many studies have only focused on the social, political and economic factors which have acted as push factors attracting migrants. But none of them has mentioned about their ultimate settlement process. Certain question arise what is estimated the amount of undocumented migration happen that time?

1.6 OBJECTIVES OF THE STUDY:

The objectives of the study are:

A. Comparison of the Growth Rates for different years (1971-2011) of Districts of West Bengal.

B. Diagrammatic Representation Of The Growth Rate Figures for comparison between the Districts Of West Bengal.

C. Test of Significance to check the change in the pattern of Growth Rates.

D. To obtain the estimated values of **Undocumented Migration** of the districts by using **Balancing Equation.**

E. Diagrammatic Representation of Calculated **Undocumented Migration** to compare between the Districts of West Bengal for different time intervals.

1.7 SOURCES OF THE DATA:

Data on population growth rates in various districts have been collected from Census data as published by the Government of India as well as the Government of West Bengal in its various volumes of Statistical Abstract (District Census Hand Book). The unnatural rates of growth in population of West Bengal for the different Census years.

The Census of India gives information on population of West Bengal for the different Census years. For our study we have used Census data for 1971, 1981, 1991, 2001 and 2011. Although there is a constant flow of migrates from Bangladesh to India but a significant number of people entered West Bengal during the time of partition of India (1946-1950) and also at the time of independence of Bangladesh (1972-1974). The cross-border migrants, normally after crossing the border, try to settle down in nearby villages or towns. A significant portion of this population was permanently settled in West Bengal. So, we clearly observed that from Census data for different years.

SECTION 2 : TO STUDY THE CHANGE IN THE PATTERN OF DISTRICTWISE MIGRATION OVER DECADES BASED ON DECENNIAL GROWTH RATES

India had experienced some of major flows people; in 1947-48 nearly 15 million Hindu and Muslims, the exodus of Burmese 1 million during 1948-65, the exodus of Sri Lankan Indians and Tamils to tune of about 1 million since 1954, about 10 million during Indo-Pak war from Bangladesh, 0.1 million Chakmas from Bangladesh to India in 1981, the unwanted population flow from Bangladesh to Assam in India and the two-way flow between Nepal and India. In 2000, India with its net migration being 6.3 million persons ranked the sixth among the top ten countries in the world with largest international migrant population (Times of India, September 12, 2006).

The national growth rate of population was 21.62 per cent (Census 1961) during the period 1951-1961 whereas the corresponding rate was 28.4 per cent in West Bengal. Now, The national growth rate of population war 30.6 per cent during the period 1971-1981 (Census 1981), whereas the corresponding rate was 23.17 per-cent in West Bengal, i.e because of higher population growth rate in 1951-1961 in West Bengal, there is clear indication of high migration during the period 1951-1961 after that growth rate started decrease down from period 1971-1981 . However, the National Growth rate of 19.22 per cent (Census 2011) during the last decade of the Census i.e 2001-2011 was higher than that of West Bengal (13.93), which may be defined as a highly possible indication of the reduction of inflows of refugees in the more recent times. If we look at the decennial growth rates in the border districts of West Bengal during the period of 1971-2011, the phenomenon of Undocumented Migration becomes more clear (see, TABLE 1).

2.1 Comparison Of The Growth Rate:

TABLE 1: District –wise Decennial Growth Rate of West Bengal (1971-2011)

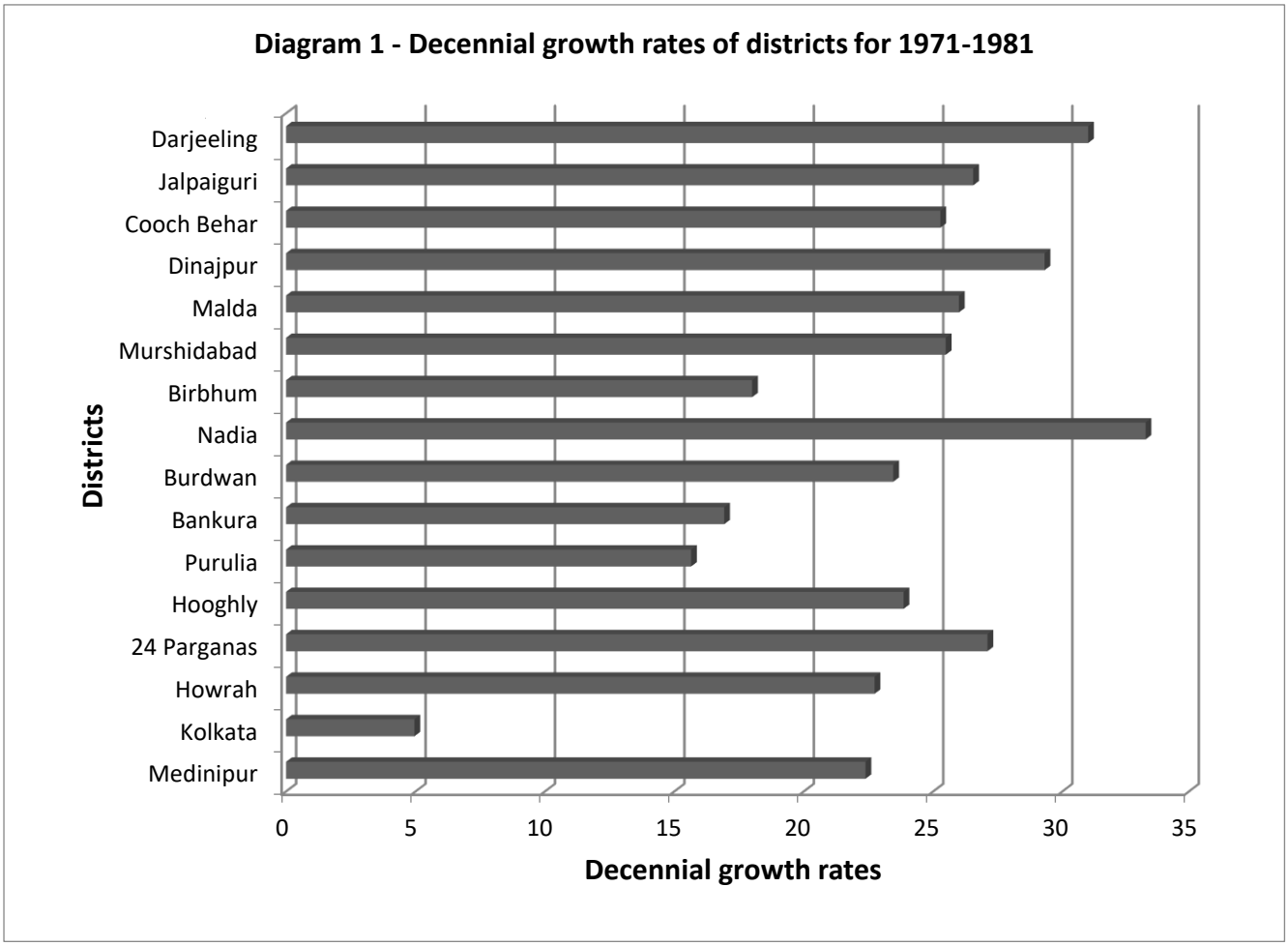
Districts	1971-81	1981-91	1991-01	2001-11
Darjeeling	31.02	26.91	23.79	14.47
Jalpaiguri	26.55	26.44	21.45	13.77
Cooch Behar	25.28	22.55	14.19	13.86
Dinajpur	29.31	29.19	25.43	17.03
Malda	26	29.78	24.78	21.5
Murshidabad	25.49	28.20	23.76	21.07
Birbhum	18.01	21.94	17.99	16.15
Nadia	33.29	29.95	19.54	12.24
Burdwan	23.46	25.13	13.96	12.01
Bankura	16.93	18.12	13.82	12.64
Purulia	15.65	20.00	14.02	15.43
Hooghly	23.86	22.43	15.77	9.49
24 Parganas	27.1	30.96	21.77	15.45
Howrah	22.74	25.71	14.57	13.31
Kolkata	4.96	6.61	3.93	1.88
Medinipur	22.39	23.57	15.35	14.88
West Bengal	23.17	24.73	17.77	13.93

Source: 1) Census Data (1971,1981,1991,2001,2011)

2) Volume of Census of India, Registrar General Of India, New Delhi.

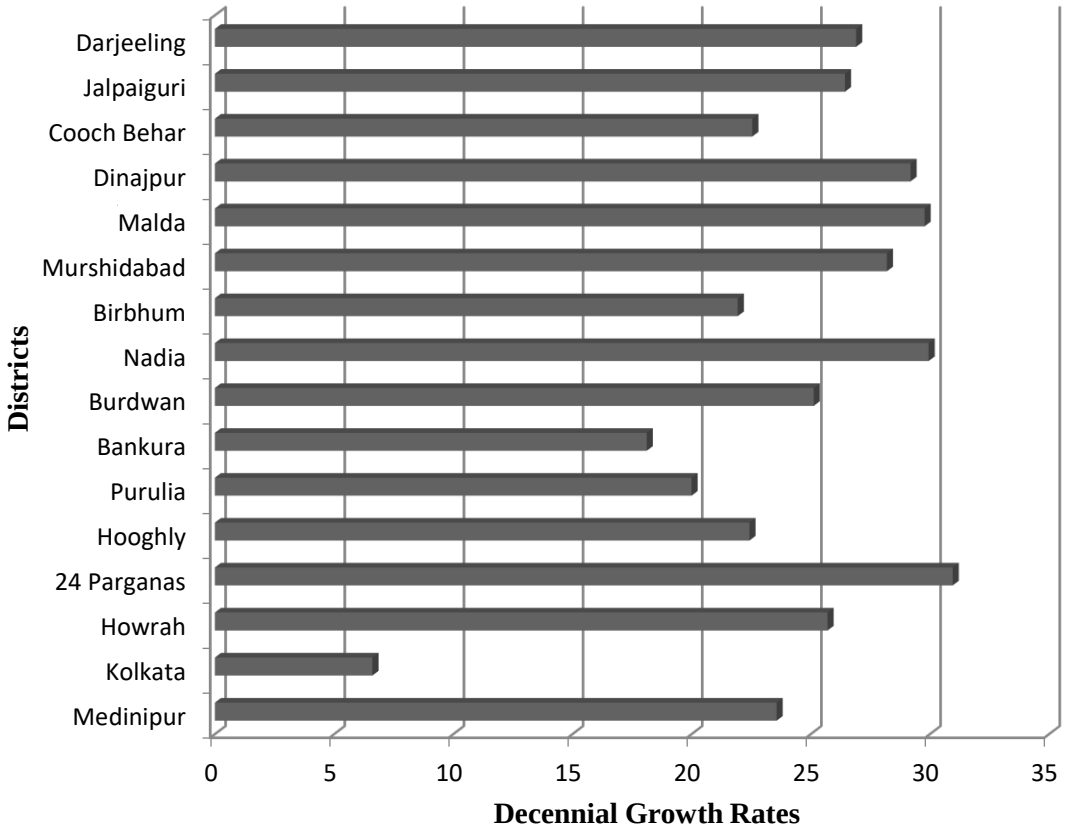
KEY FINDINGS: There is a constant flow of migrants from Bangladesh to India but a significant number of people entered West Bengal during the time of partition of India (1946-1950) and also at the time of independence of Bangladesh (1972-1974). Here our analysis based after independence of Bangladesh. There are eight districts in West Bengal bordering Bangladesh viz. Cooch Behar, Jalpaiguri, Darjeeling, Dinajpur, Malda, Murshidabad, Nadia and 24 pargana. It is observed from Table1 that the population growth in the bordering districts is more than the overall population growth of the state as whole. After two decade of partition all border districts had higher population growth i.e the highest growth rate was observed in Nadia(33.29 percent)followed by Darjeeling(31.02 percent) then Dinajpur(29.31 percent).Among the interior districts , Burdwan (23.46 percent) and Medinipur(22.39 percent) and Hooghly (23.86) and Howrah(22.74 percent) had high growth rates. The intensity of growth rates are slightly increase in the eighties than seventies then it decreased down as the year progresses. The border districts maintained higher growth rate expect one or two cases such as Darjeeling. Darjeeling maintained highly growth rate in three decade 1971-1981,1981-191,1991-2001.During the last decade i.e 2001-2011, Malda (21.5 percent), Murshidabad (21.07 percent) were leading growth districts in West Bengal. The higher growth rates are an indication of immigration of population from neighbouring Bangladesh. In Darjeeling, it might be due to migration from Nepal and Bhutan as well. Given The Bar charts explaining the high and low growth rates to corresponding districts for respectively decades.

2.2 Diagrammatic Representation Of The Growth Rate Figures:



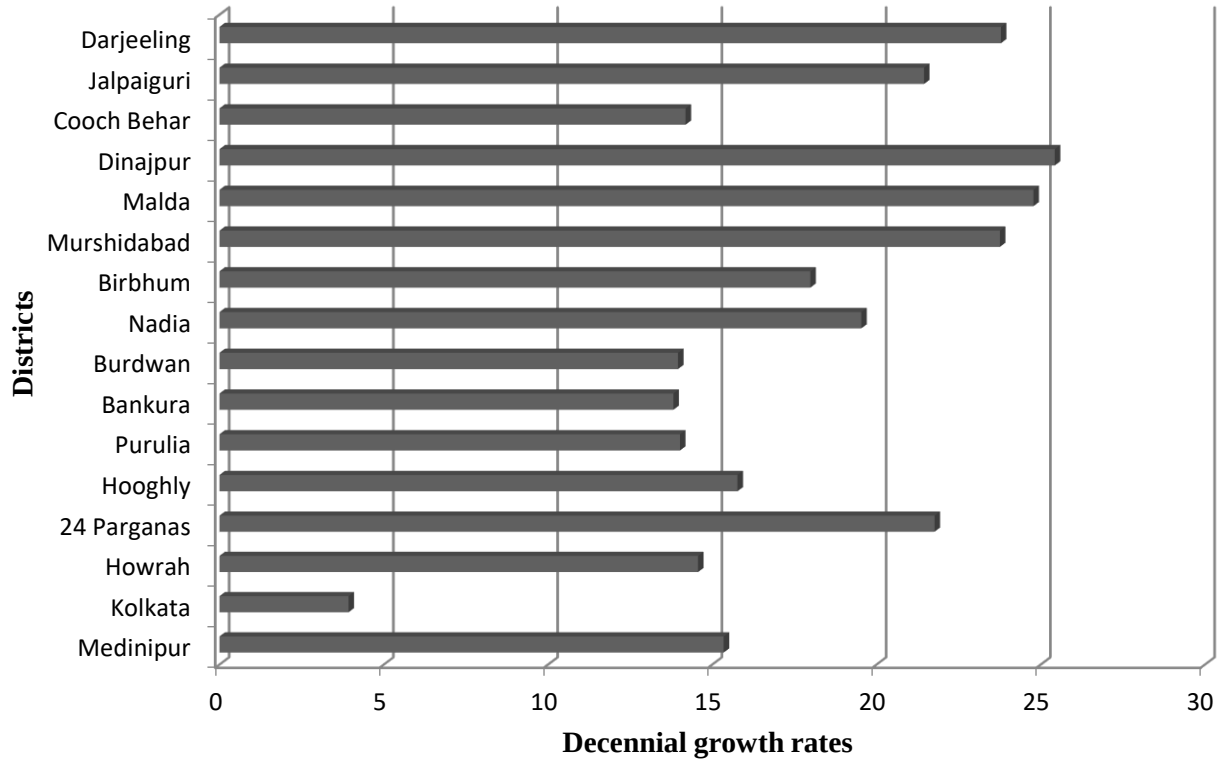
KEY FINDINGS:- From the above Bar Diagram of Decennial Growth in 1971-1981 of the districts of West Bengal, **Nadia** district have the highest decennial growth rate then **Darjeeling** have , then **Dinajpur** have most . Because of 1971 Indo-Pak war, it is clear that large number of migrants had settlement in **Nadia, Dinajpur and 24 Parganas** during 1971-1981. Also, bordering districts like **Malda**, **Murshidabad** have the large decennial growths than the districts **Medinipur, Bankura** which are far from border. There is constant flow from Nepal and Bhutan that's why Darjeeling have such high growth rate.

DIAGRAM 2- Decennial growth rates of districts inv1981-1991



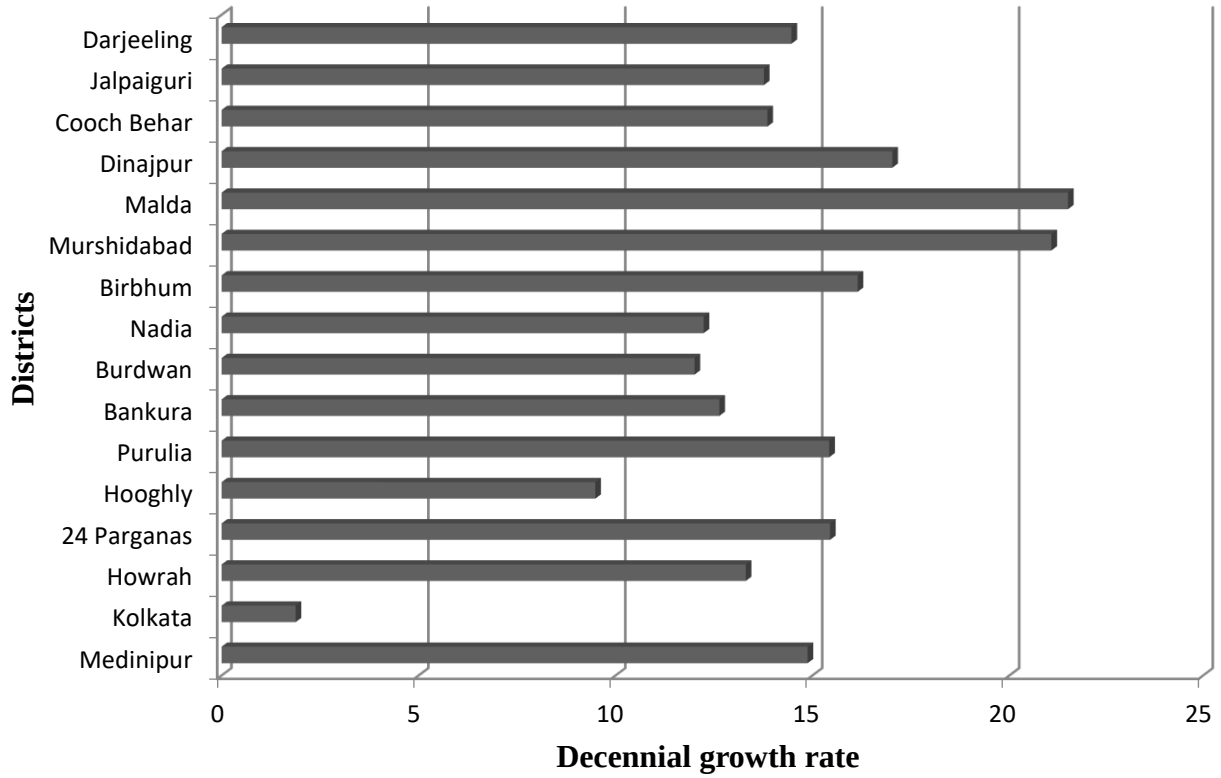
KEY FINDINGS :- From the above diagram , Decennial Growth Rate of districts of West Bengal in 1981-1991; bordering districts **Nadia, Malda, Dinajpur, 24 parganas, Murshidabad** maintained high decennial growth rates i.e there is constant flow between bordering districts and Bangladesh. Darjeeling maintained high growth rate because of Nepal and Bhutan migration. **Howrah, Hooghly, Birbhum** maintained average growth rate. The districts like **Purulia, Medinipur, Bankura** which are far from border maintain low decennial growth rate.

DIAGRAM 3: Decennial growth rates of districts for 1991-2001



KEY FINFINGS: From the above diagram, Bordering districts **Dinajpur, 24 parganas, Malda**, **Murshidabad** have maintained high decennial growth rate. As well as, the districts which are far from border maintained low growth rate. Exceptional is Darjeeling, where there is constant flow from Nepal and Bhutan.

DIAGRAM 4: Decennial growth rates of districts for 2001-2011



KEY FINDINGS: After 20-30 year of Indo- Pak war**,** there is no change in bordering districts decennial growth rate. **Malda, Murshidabad, Dinajpur** have the high decennial growth comparison to the districts which are far from border like **Hooghly, Purulia.** So, the higher growths are an indication of immigration of population from the neighbouring Bangladesh which is constant inflow over the years.

2.3 TEST OF SIGNIFICANCE OF CHANGE IN THE PATTERN OF GROWTH RATES :-

Now, Pearson correlation coefficient between the decades are presented in the Table 2.

Table 2: Pearson correlation coefficient values between the decades

Year	1971-1981 and 1981-1991	1971-1981 and 1991-2001	1971-1981 and 2001-2011	1981-1991 and 1991-2001	1981-1991 and 2001-2011	1991-2001 and 2001-2011
Correlation coefficient	.9185	.8107	.5966	.8781	.7823	.8141

We have correlation coefficient between 1971-1981 and 1981-1991 is .9185 which is greater than the correlation coefficient between 1971-1981 and 1991-2001 which is .8107 i.e 1971-1981 and 1981-1991 are highly correlated than 1991-2001 i.e 1971-1981 have more influence on 1981-1991 than 1991-2001.

Now to test, we have already calculated the correlation coefficient(r) between the decades and calculated t-statistics for testing significance of correlation coefficient. The procedure for testing the significance of correlation coefficient is as follows:

H_0: r=0 (i.e population correlation coefficient is zero)

AND

Alternative hypothesis **H_1**: true correlation is not equal to 0

$t= \frac{r}{\sqrt{(1-r^2)/n-2}}$, with (n-2) degrees of freedom, where n number of observations involved in the test. The value of t-statistics and p-value are given in Table 3.

Table3: Value of t statistics and p- value

YEAR	1971-1981 and 1981-1991	1971-1981 and 1991-2001	1971-1981 and 2001-2011	1981-1991 and 1991-2001	1981-1991 and 2001-2011	1991-2001 and 2001-2011
t-statistic	8.69	5.18	2.78	6.68	4.7	5.24
p-value	5.123e-07	.000139	.0147	7.694e-06	.00034	.00012

2.4 CONCLUSION:

so, we can say that there are significant correlation coefficients between decennial growth rate of 1971-81 and 1981-91 i.e they are highly correlated, that time the migration is ongoing rapidly, now the correlation coefficients between decennial growth rate of 1971-81 and 1991-2001 and 2001-2011 are less i.e they are less correlated, it means it is clear that the migration process decrease. The tabulated value of t-statistic with degrees of freedom 14 at 5% level of significance. From p values it is clear that all p values are less than .05 it means null hypothesis rejected it means that there is a significant correlation coefficient. It means that in terms of migration the first two decades were same. However, pattern change in last two decades and the calculated value of correlation coefficient (ρ) is low, though it was significant also. As a result of the overall changing pattern during the past four decades, there was changes in coefficient of correlation between the decades. That means that the district-wise pattern of migration changed over the past four decades significantly.

SECTION 3: ESTIMATION AND COMPARISON OF UNDOCUMENTED MIGRATION FOR DISTRICTS

3.1 INDIRECT METHOD:

The flow of population across national borders has been a topic of serious discussion among social scientists for a long period. A few sociologists and anthropologists as well as economists have studied the problem of migration in the lights of demographic transition, ethnicity, racism and globalisation and political characteristics of host countries. Several attempts have been made by population scientists to study undocumented migration both in India and abroad. Different approaches based on **push and pull theory, network theory, transmigration theory** etc have been developed to explain undocumented migration. Such migration mainly depends on information about the receiving country, travel routes, shelter at different points etc. There are different networks through which such information may be obtained. Push factors like unemployment, political unrest, attack from persons belonging to larger communities etc responsible for such moves. Pull factors like income opportunities, family reunion, political stability also responsible for '**Undocumented Migration'**.

In India studies on **'Undocumented Migration'** have been done by population scientist like Datta p. (2000, 2002, 20003), Banerjee B. (2003), Guha Ray S. (2003) and others. But most of these studies are mainly related to effects and reasons of undocumented migration. It is very difficult to measure the amount of undocumented migration directly. In the present work an indirect method has been used to estimate the amount under the assumption that people who entered a country illegally and eventually settled their residence in that country will ultimately collect some evidence of national citizenship.

3. 2 Balancing equation:

The most basic method of demography is the decomposition of population change into its components. We may express the process in terms of the fundamental equation

$$\mathbf{P_t - P_o = (B - D) + (I - O)} \quad \text{.....(1)}$$

Where, P_t is the population at the end of the period t, P_o that at the beginning of the period, B is the births, D is deaths, I is in-migration and o is out- migration. The above simple equation may have different forms and different uses.

In our situation if we denote two successive census time points by t and t+1 then we may write

$$\mathbf{P_{t+1} = P_t + R_t\ P_t + I_t} \quad \text{..... (2)}$$

Where $\mathbf{P_t}$ is the population at the census time point i (i=t, t+1). $\mathbf{R_t}$ is the decennial growth rate at the time point t and $\mathbf{I_t}$ is the net migration during the period (t,t+1). For the regions under consideration, $\mathbf{I_t}$ may be considered to be the total **"Undocumented Migration".** Note that since the census time points are ten years apart the illegal migrants are likely to collect same evidence of citizenship during that period and are most likely to be enumerated at the census time point (t+1). Now, we have collected the population corresponding to the districts in 1971 ,1981,1991,2001, 2011 year from Census data. We calculate the relative growth rates corresponding to the districts in the years 1971-81,1981-91,1991-01,2001-11. **So, now we use that equation no. 2 to estimate I_t values for districts for corresponding census years.**

3.3 ESTIMATED UNDOCUMENTED MIGRATION VALUES FOR 1971-1981

TABLE -4: ESTIMATED VALUES OF UNDOCUMENTED MIGRATION FOR 1971-1981

DISTRICTS	POPULATION AT TIME POINT 1971(Pt)	POPULATION AT TIME POINT 1981(Pt+1)	RELATIVE GROWTH RATE AT 1971(Rt)	It
DARJEELING	781777	10,24,269	0.078136	181407.0723
JALPAIGURI	17,50,159	22,14,871	0.070986	340475.2132
COOCH BEHAR	14,14,183	17,71,643	0.068702	260302.7995
DINAJPUR	9,29,943	1202478	0.079359	198735.6535
MALDA	16,12,657	20,31,871	0.071203	304387.9836
MURSHIDABAD	29,46,563	36,97,552	0.070524	543185.591
BIRBHUM	17,75,909	20,95,829	0.048801	233253.8649
NADIA	22,23,911	29,64,253	0.091023	537914.949
BURDWAN	39,16,174	48,35,388	0.061987	676462.1223
BANKURA	20,31,039	23,74,815	0.045946	250457.8821
PURULIA	16,02,875	18,53,801	0.042847	182247.6149
HOOGHLY	28,72,116	35,57,306	0.064162	500909.2932
24 PARGANAS	39,35,404	49,58,799	0.07327	735047.9489
HOWRAH	24,17,286	29,66,861	0.060763	402693.4508
MEDINIPUR	27,54,623	3371398	0.059948	451640.8604

KEY FINDINGS: From the estimated undocumented values, **24 Parganas** have the highest undocumented migration, then **Burdwan** and then **Murshidabad** and **Nadia** have the highest value of estimated undocumented migration corresponding to the other districts. Despite of being far from Bangladesh border, **Howrah** and **Hooghly** district much higher value then non-bordering district. So, clearly seen that there is a settlement of immigrants. During the Indo-Pak war in 1971 most of immigrants are settling in the bordering districts **24 Parganas, Nadia, Murshidabad** that's why bordering districts have much higher value then the non-bordering districts like **Purulia, Bankura, Birbhum**.

3.4 ESTIMATED UNDOCUMENTED MIGRATION VALUES FOR 1981-1991

TABLE -5: ESTIMATED VALUES OF UNDOCUMENTED MIGRATION FOR 1981-1991

DISTRICTS	POPULATION AT TIME POINT 1981(Pt)	POPULATION AT TIME POINT 1991(Pt+1)	RELATIVE GROWTH RATE AT 1981(Rt)	It
DARJEELING	10,24,269	12,99,919	0.064307222	209782.1063
JALPAIGURI	22,14,871	28,00,543	0.063184056	445727.4671
COOCH BEHAR	17,71,643	21,71,145	0.053888066	304031.5855
DINAJPUR	1202478	1563826	0.069755771	277468.2198
MALDA	20,31,871	26,37,032	0.071165703	460561.4723
MURSHIDABAD	36,97,552	47,40,149	0.067389954	793419.1421
BIRBHUM	20,95,829	25,55,664	0.05243034	349949.9733
NADIA	29,64,253	38,52,097	0.071571954	675686.6197
BURDWAN	48,35,388	60,50,605	0.06005353	924834.8836
BANKURA	23,74,815	28,05,065	0.04330163	327416.6401
PURULIA	18,53,801	22,24,577	0.047794293	282174.8912
HOOGHLY	35,57,306	43,55,230	0.0536013	607247.7739
NORTH 24 PARGANS	55,29,497	72,81,881	0.075730058	1333634.872
SOUTH 24 PARGANS	43,88,102	57,15,030	0.072264972	1009821.934
HOWRAH	29,66,861	37,29,644	0.061439564	580500.3534
MEDINIPUR	3371398	41,65,956	0.056325575	604662.07

KEY FINDINGS: From the above estimated values, among the bordering districts **North 24 Parganas** and **South 24 Parganas** have highest undocumented migration. **Also, Murshidabad and Nadia** undocumented migration value is much higher. So, after 10-20 years of Indo-Pak war the influx of people did not decrease**.** Rather, it is clearly seen that because of the increasing of immigrants, the non-bordering district **Howrah, Hooghly, Medinipur** have much high undocumented migration value. The immigrants people also settled far from the border districts. So, there is a large amount of immigrant people have settled both bordering and non- bordering districts in 1981-1991.

3.5 ESTIMATED UNDOCUMENTED MIGRATION VALUES FOR 1991-2001

TABLE -6: ESTIMATED VALUES OF UNDOCUMENTED MIGRATION FOR 1991-2001

DISTRICTS	POPULATION AT TIME POINT 1991(Pt)	POPULATION AT TIME POINT 2001(Pt+1)	RELATIVE GROWTH RATE AT 1991(Rt)	It
DARJEELING	12,99,919	16,09,172	0.071801527	215916.8308
JALPAIGURI	22,14,871	34,01,173	0.064739082	1042913.285
COOCH BEHAR	21,71,145	24,79,155	0.042827393	215025.5198
UTTAR DINAJPUR	1897045	2441794	0.086680953	380311.3315
DAKSHIN DINAJPUR	12,30,608	15,03,178	0.066851779	190301.6659
MALDA	26,37,032	32,90,468	0.074789485	456213.7348
MURSHIDABAD	47,40,149	58,66,569	0.071710983	786499.2556
BIRBHUM	25,55,664	30,15,422	0.054296321	320994.8471
NADIA	38,52,097	46,04,827	0.058974436	525554.752
BURDWAN	60,50,605	68,95,514	0.042133221	589977.5224
BANKURA	28,05,065	31,92,695	0.041710681	270628.8286
PURULIA	22,24,577	25,36,516	0.042314309	217807.5614
HOOGHLY	43,55,230	50,41,976	0.047596052	479454.2464
NORTH 24 PARGANAS	72,81,881	89,34,286	0.068481574	1153730.327
SOUTH 24 PARAGANS	57,15,030	69,06,689	0.062928198	832022.4606
HOWRAH	37,29,644	42,73,099	0.043974285	379446.5718
MEDINIPUR	83,31,912	96,10,788	0.046328434	892871.5648

KEY FINDINGS: From the estimated values, among the bordering districts **North 24** Parganas have the highest undocumented migration followed by **Soth 24 Parganas, Murshidabad**. But among non-bordering district **Jalpaiguri**, **Medinipur** have highest undocumented migration. Among non-bordering district **Purulia, Bankura, Birbhum** have less undocumented migration.

3.6 ESTIMATED UNDOCUMENTED MIGRATION VALUE FOR 2001-2011

TABLE -7: ESTIMATED VALUES OF UNDOCUMENTED MIGRATION FOR 2001-2011

DISTRICTS	POPULATION AT TIME 2001(Pt)	POPULATION AT TIME POINT 2011(Pt+1)	RELATIVE GROWTH RATE 2011(Rt)	It
DARJEELING	16,09,172	18,46,823	0.053833848	1760195.025
JALPAIGURI	34,01,173	38,72,846	0.051229584	297432.3206
COOCH BEHAR	24,79,155	28,19,086	0.051564418	212094.8145
UTTAR DINAJPUR	2441794	3000849	0.085196622	351022.3998
DAKSHIN DINAJPUR	15,03,178	16,70,931	0.041519402	105341.9487
MALDA	32,90,468	39,88,845	0.079988095	435178.7337
MURSHIDABAD	58,66,569	71,03,807	0.078388333	777367.4363
BIRBHUM	30,15,422	35,02,404	0.060084081	305803.1418
NADIA	46,04,827	51,67,600	0.045537408	353081.1124
BURDWAN	68,95,514	77,17,563	0.044681722	513945.5619
BANKURA	31,92,695	35,96,674	0.047025559	253840.733
PURULIA	25,36,516	29,30,115	0.057405409	247989.2605
HOOGHLY	50,41,976	55,19,145	0.035306373	299155.1147
NORTH 24 PARGANS	89,34,286	1,00,82,852	0.047844042	721113.647
SOUTH 24 PARGANS	69,06,689	81,53,176	0.067152796	782682.5235
HOWRAH	42,73,099	48,41,638	0.048518211	356942.7811
PURBA MEDINIPUR	44,17,377	50,94,238	0.056996168	425087.4383
PASCHIM MEDINIPUR	51,93,411	59,43,300	0.053722237	470887.345

KEY FINDINGS: From the above table, bordering districts like **North 24 Parganas, South 24 Parganas, Murshidabad, Malda** have high undocumented migration compare to other districts. Non-bordering districts like **Purulia, Bankura** have less undocumented migration. The amount of the migration did not stopped it's just decreased down as the year progresses because of high alert bordering system that's why all districts undocumented migration have less value.

3.7 AREA IN SQUARE KILOMETER FOR DISTRICTS

TABLE 8: AREA IN SQUARE KILOMETER FOR DIFFERENT DISTRICTS IN DIFFERENT TIME POINTS

DISTRICTS	AREA IN SQUARE KILOMETER FOR DIFFERENT DISTRICTS			
	1971	1981	1991	2001
DARJEELING	3075	3165	3202	3149
JALPAIGURI	6245	6194	6227	6227
COOCH BEHAR	3386	3414	3401	3387
DINAJPUR	5206	5331.5	5304	5359
MALDA	3713	3658	3722	3733
MURSHIDABAD	5341	5245.5	5324	5324
BIRBHUM	4550	4518	4533	4545
NADIA	3926	3912	3921	3927
BURDWAN	7028	6995	7004	7024
BANKURA	6868.5	6868.5	6881.5	6882
PURULIA	6259	6187	6199.5	6259
HOOGHLY	3145	3133.5	3135.5	3149
24 PARGANAS	13796	8430	13748.5	14054
HOWRAH	1474	1405.5	1413.5	1467
MEDINIPUR	13724	13422.5	13660	14081

3.8 ESTIMATED UNDOCUMENTED MIGRATION VALUES PER SQUARE KILOMETER FOR DISTRICTS

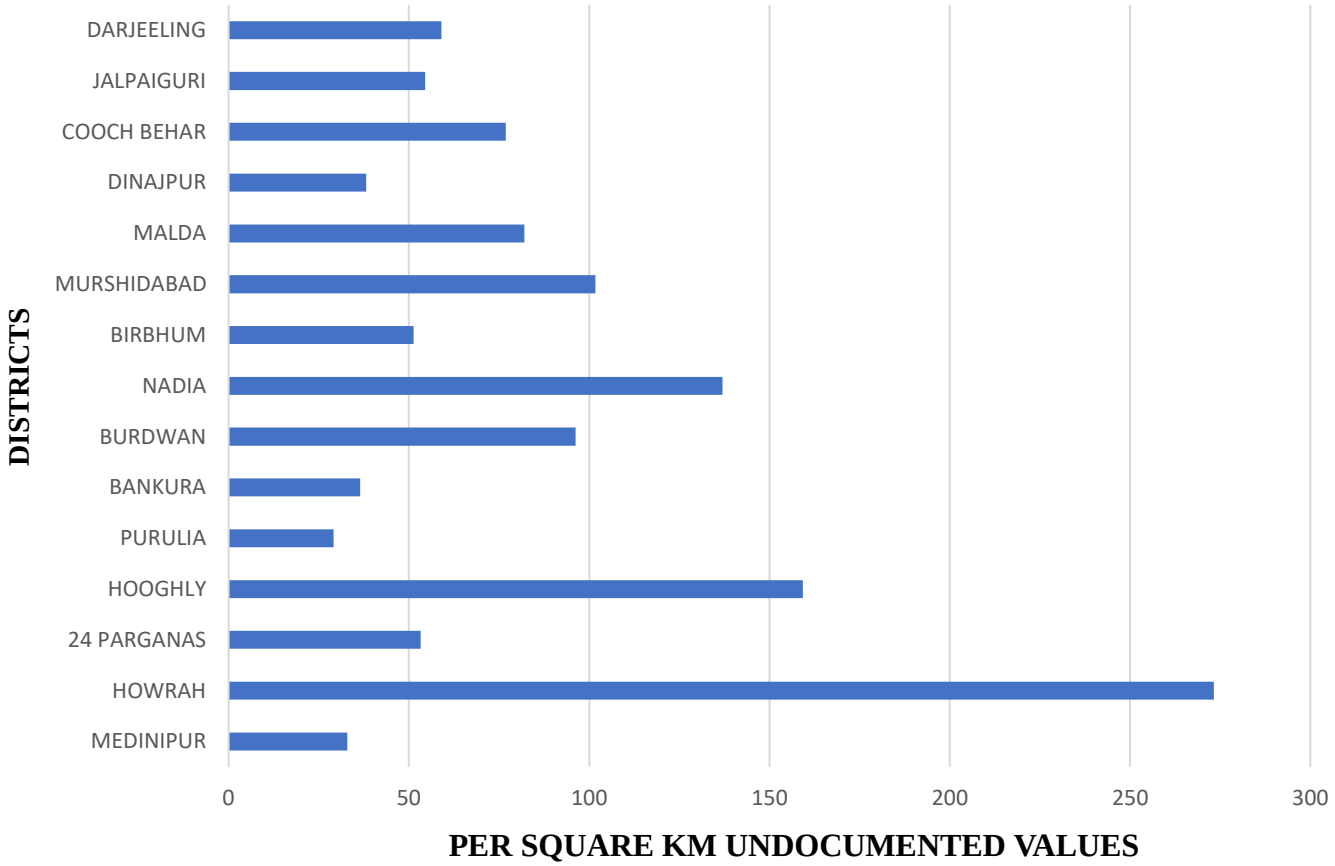
TABLE 9: ESTIMATED UNDOCUMENTE MIGRATION VALUES IN PER SQUARE KILOMETER FOR DIFFERENT YEARS

DISTRICTS	PER SQUARE KILOMETER UNDOCUMENTED MIGRATION FOR DIFFERENT YEARS			
	1971	1981	1991	2001
DARJEELING	58.99416985	66.28186613	67.43186471	48.33857294
JALPAIGURI	54.51964999	71.96116679	167.4824611	48.15096856
COOCH BEHAR	76.87619595	89.05436013	63.22420459	63.14094942
DINAJPUR	38.17434758	52.04318106	107.5816359	85.85469119
MALDA	81.97898831	125.9052685	122.5722017	117.5488134
MURSHIDABAD	101.7012902	151.2571046	147.7271329	147.2035391
BIRBHUM	51.26458569	77.4568334	70.81289369	67.83335952
NADIA	137.0134868	172.7215286	134.035897	90.64780873
BURDWAN	96.2524363	132.2137074	84.23436927	73.77506323
BANKURA	36.46471313	47.66930772	39.32701135	37.18569972
PURULIA	29.11768891	45.60770829	35.13308515	39.94216953
HOOGHLY	159.2716354	193.7921729	152.911576	95.77990759
24 PARGANAS	53.27978754	167.1211842	144.4341412	107.8762352
HOWRAH	273.1977278	413.0205289	268.4446918	245.3046251
MEDINIPUR	32.90883565	45.04839411	65.36385057	64.150072

KEY FINDINGS: From the table, **Howrah district** have highest per square undocumented migration among all districts in all four decades**. In 1981, the value is much higher than other districts i.e people are mostly settled in Howrah district**. Bordering districts **Malda, Murshidabad, 24 Parganas** have maintained high rate throughout the four decades. But all bordering districts **24 Parganas, Nadia, Murshidabad, Malda** have much high value in 1981 compare to other years. In 1991, **Jalpaiguri** have the high per square undocumented migration followed by **Howrah.** Among non-bordering district **Hooghly** district have higher per square kilometer undocumented migration then **Burdwan**. After crossing the border not only people settled in bordering districts, the immigrants are settling mostly **Hooghly, Howrah, Burdwan district** which is far from border. In the first two decades the amount of per square kilometer undocumented migration increases but in last two decades the amount decreases down. Because of Nepal and Bhutan migration to Darjeeling the rate almost constant throughout the four decades.

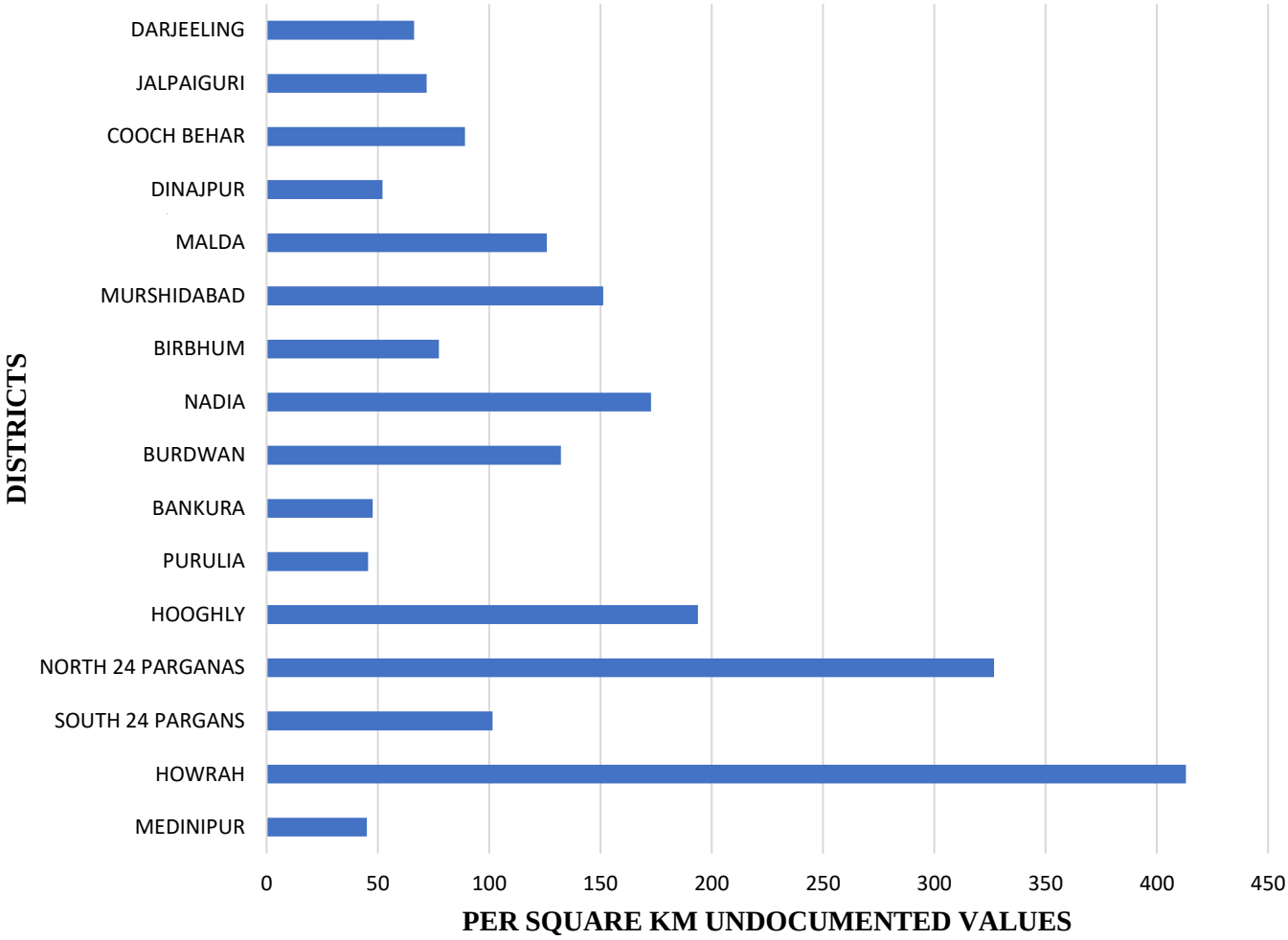
3.9 DIAGRAMETIC REPRESENTATION AND COMPARISON BETWEEN UNDOCUMENTED MIGRATION AMONG DISTRICTS

DIAGRAM 5 :- DIAGRAM OF PER SQUARE KILOMETER UNDOCUMENTED MIGRATION VALUES FOR DISTRICTS IN 1971



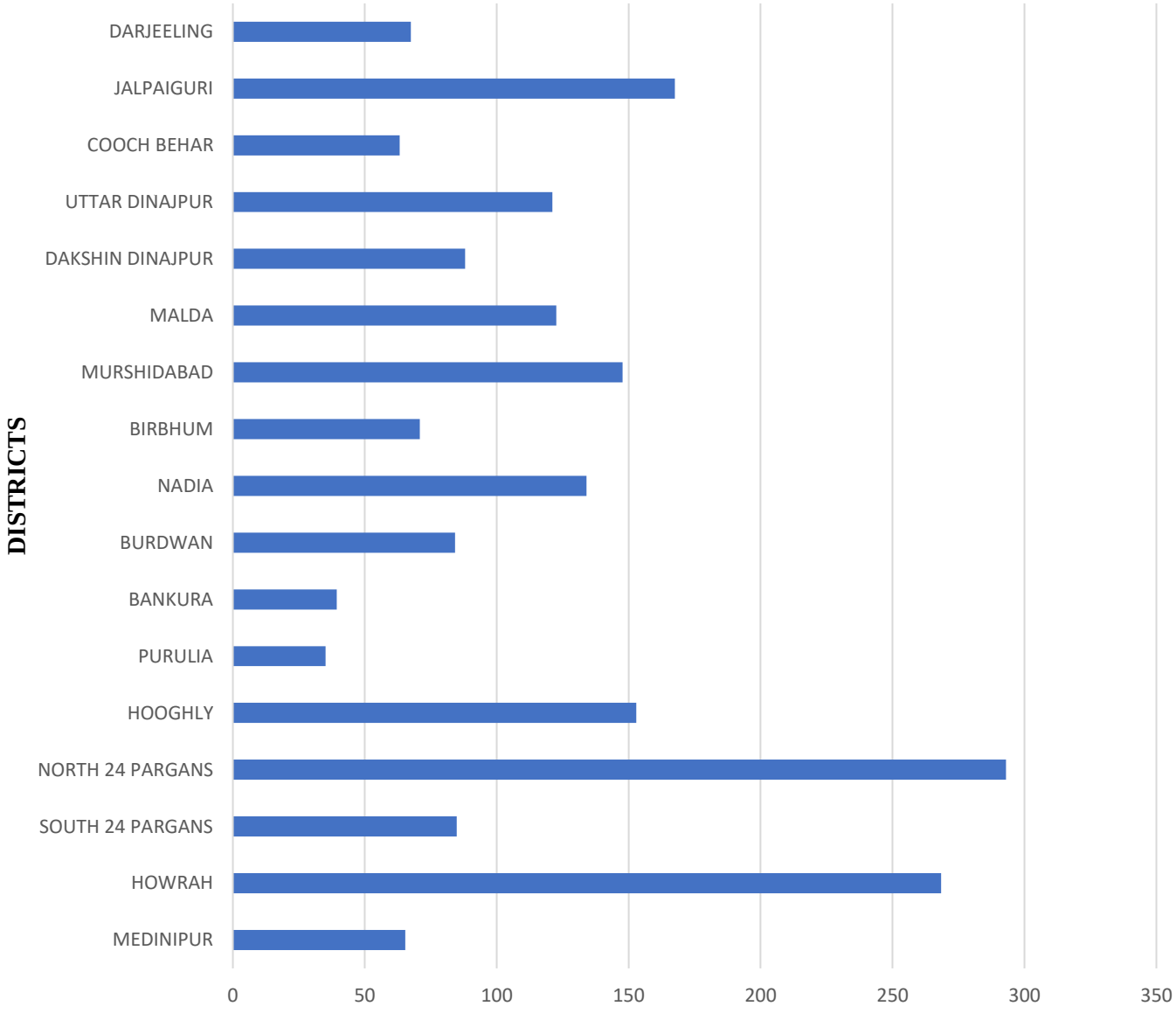
KEY FINDINGS: Despite being far from the border of Bangladesh, **Howrah district have the highest per square kilometer undocumented migration value**, then **Hooghly** district have the most number, then Nadia and them Murshidabad have the high value . But the bordering **districts Dinajpur, Malda, 24 Parganas** have much low per square kilometer undocumented migration value comparison to Howrah. Only **Nadia** district have high number comparison to the bordering districts. **Purulia and Medinipur** have minimum per square kilometer undocumented migration value. **So, during Indo-Pak war and after that there a large number of migrants from have been settled in Howrah.**

DIAGRAM 6 :- DIAGRAM OF PER SQUARE KILOMETER UNDOCUMENTED MIGRATION VALUES FOR DISTRICTS IN 1981



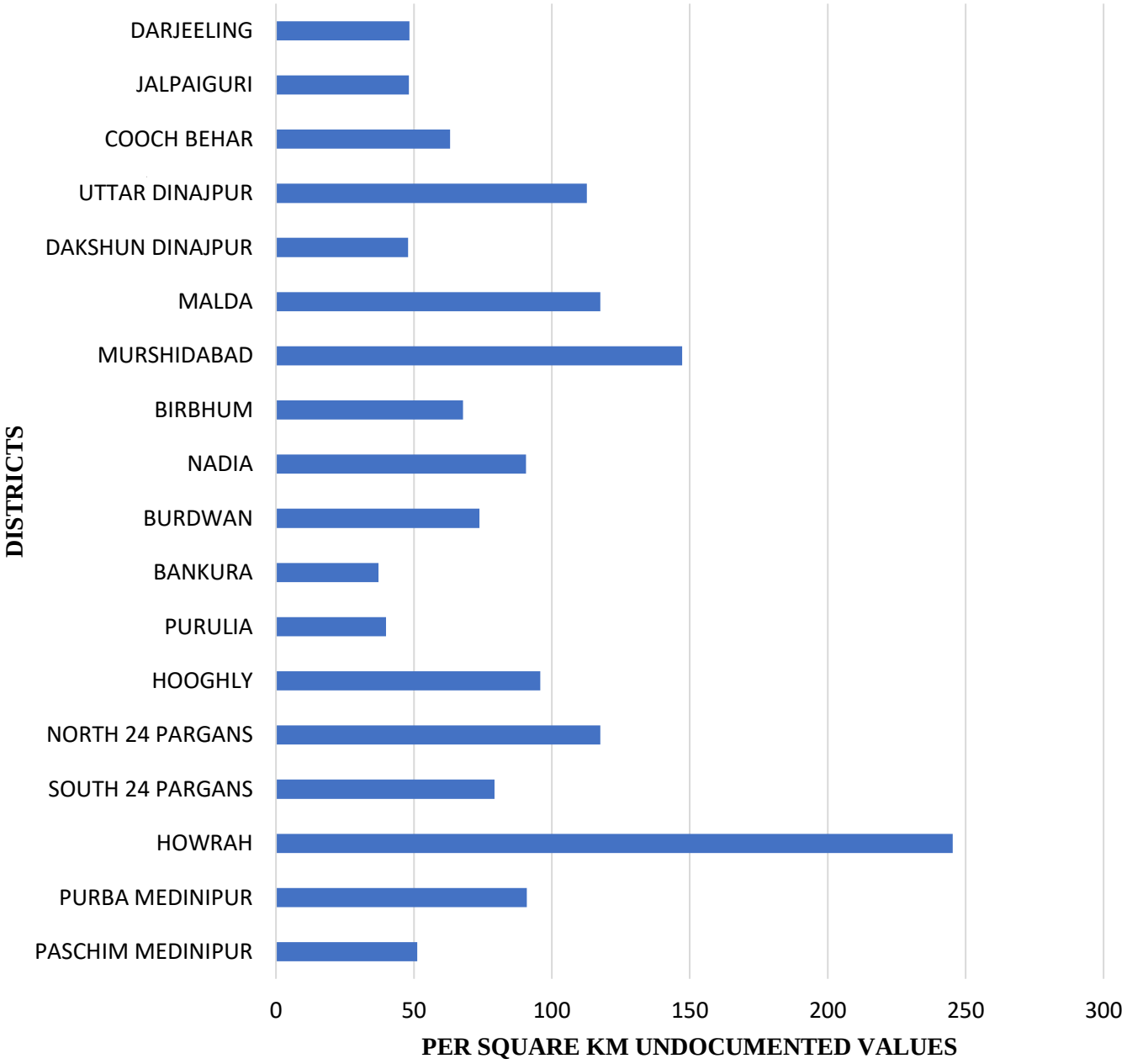
KEY FINDINGS: As per diagram, **Howrah district have the highest per square kilometer undocumented value**. Among bordering districts **North 24 Parganas** have the highest number compare to **Nadia, Murshidabad, Malda**. Among non-bordering districts after **Howrah, Hooghly** district have the highest number. Despite **Dinajpur** bordering district, **Dinajpur** have low per square kilometer undocumented migration value. Among non- bordering district **Birbhum**, **Bankura, Purulia, Medinipur** have the low number. **It is clearly seen that large number of migrants from Bangladesh are constantly settling in Howrah District.**

DIAGRAM 7 :- PER SQUARE KILOMETER UNDOCUMENTED MIGRATION FOR DISTRICTS IN 1991



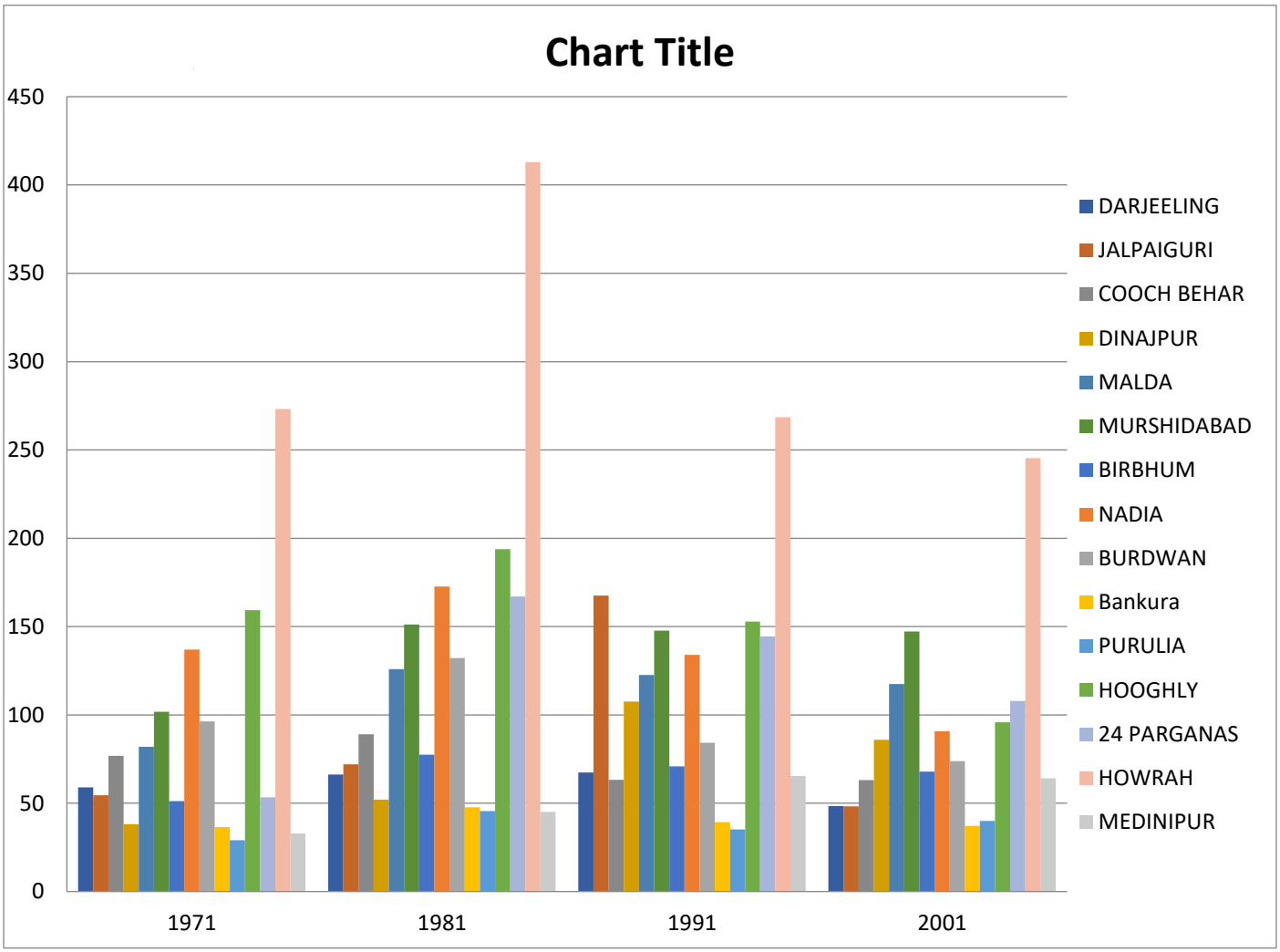
KEY FINDINGS: As per diagram, in 1991 **North 24 Parganas** have the highest per square kilometer undocumented migration values, **Howrah** district have the most number. **In 1991 Jalpaiguri** have the 3rd highest number and the value is much high compare to 1981 value i.e there is a clear indication of illegal migrants settlement in Jalpaiguri. As usual, bordering districts like **Malda, Murshidabad, Nadia** maintained high value of per square undocumented migration than the non – bordering districts **Purulia, Bankura, Medinipur, Birbhum.**

DIAGRAM 8 :- PER SQUARE KILOMETER UNDOCUMENETD MIGRATION VALUES IN 2001



KEY FINDINGS: As per diagram, again **Howrah** District have the highest number of undocumented migration in per square kilometer. Among bordering district **Murshidabad** have the highest number. Also, **Malda, Uttar Dinajpur, North 24 Parganas** have high values. Among non-bordering districts **Purba Medinipur and Hooghly** have decent number. As usual non- bordering districts like **Purulia, Birbhum, Bankura** have low number of per square undocumented migration**. Despite of bordering district, Cooch Behar and Dakshin Dinajpur have low number of per square kilometer undocumented migration value.**

3.10 DIAGRAMATIC REPRESENTATION FOR DIFFERENT TIME-INTERVALS



a. **Among all districts, Howrah district have highest per square kilometer undocumented migration in all four decades.**
b. **Among non-bordering districts, Hooghly and Burdwan district have high per square kilometer undocumented migration in first two decades then in the last two decades the rate decreased.**
c. **Purulia, Bankura have low per square kilometer undocumented migration in all four decades.**

3.11 CONCLUSION:

Cross-border migration is not a new phenomenon witnessed by India. India has received immigrants from almost all neighbouring countries since long ago. But the immigration from Bangladesh to West Bengal has raised concern as the flow has been mainly in unilateral and continuous, particularly those districts which are bordering with Bangladesh i.e **Nadia, North 24 Parganas, Malda, Dinajpur**. Though the flow of migration is continuous, the intensity has varied over time and the variations have been due to various reasons.

It is clearly seen that **Howrah** district have the highest per square undocumented migration value in three decade **1971,1981,2001 and in 1991 North 24 Parganas** have the highest number. **Nadia, Malda, Murshidabad** also maintaining high number throughout the four decades. After crossing the border, the people have no rights on their homes and lands, this brings to the question of the rights of refuges, particularly of women, children, old persons. Many refugees settled down on their own or with the help of family members, relative and friends. **The present work shown that the immigrants from Bangladesh are settling in Howrah that's why Howrah district maintain high rate throughout the four decades**, also they are settling in **Hooghly** district that's why the value is average throughout the three decades, mostly the immigrants are settling in bordering districts **Nadia, Murshidabad, North 24 parganas** that's why these districts value is much higher than the non-bordering districts **Medinipur, Birbhum, Burdwan, Purulia**.

The presence of sympathetic State Government and relations of these immigrants in the positions of power (both in terms of wealth and political) further facilitated this influx. Therefore, the artificial border and its fencing are unable to keep the Hindus on either side of the border separated. The people who entering even worse off economically but still the peace, security of life and presence of relatives have offset such disincentives of economic hardship. So, the influx of Bangladeshi migrants would not be stopped Bangladesh becomes politically stable and economically prosperous.

SUMMARY OF THE FINDINGS :-

The major findings are as follows:

1) The first analysis based on Census of India figures shows that West Bengal had higher population growth rates than all Indian during the four decades since Partition of India. Certainly, the higher growth rate reflects the magnitude of cross-bordering migration from neighbouring Bangladesh (East Pakistan). Only during the decade of the 1990s, the population growth rate of West Bengal was lower (17.8 per cent) than that of all-India (22.7 per cent) and also on 2001. Obviously, the inflow of refugees/migrants has declined in recent years.
2) The pattern of population growth vis- à-vis the pattern of migration was not uniform over the decades. Among the four decades, the pattern of growth was the same in the first two decades, while it changed in the next two decades.
3) From the test of significance, we found that the last two decades are highly correlated, the more years passing the correlation between the years are decreases. That means that the district-wise pattern of migration changed over the past four decades significantly.
4) After equating undocumented migration using Balancing Equation, we found that bordering district Malda, 24 Parganas, Murshidabad maintained high rate over the four decades after Indo-Pak war 1970. But Howrah district have the highest rate in 1971,1981,2001 and in 1991 North 24 Parganas have the highest rate. So, after crossing border the immigrants had settlement mostly in Howrah and then Hooghly district also so far from Bangladesh but the place is also having high concentrations of Bangladeshi migrants. Malda, Murshidabad have maintained almost constant rate of per square undocumented migration value over four decades. Purulia, Medinipur, Birbhum have low rate throughout the four decades because of far from border, so there is not much settlement of immigrants from Bangladesh. Darjeeling have constant rate throughout the four decades because of migration from Nepal and Bhutan.

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APPENDIX

A) Population figures of different years:

DISTRICTS	1971
Darjeeling	7,81,777
Jalpaiguri	17,50,159
Cooch Behar	14,14,183
Dinajpur	929943
Malda	16,12,657
Murshidabad	29,46,563
Birbhum	17,75,909
Nadia	22,23,911
Burdwan	39,16,174
Bankura	20,31,039
Purulia	16,02,875
Hooghly	28,72,116
24 Parganas	39,35,404
Howrah	24,17,286
Medinipur	27,54,623
West Bengal	4,43,12,011

DISTRICTS	1981
Darjeeling	10,24,269
Jalpaiguri	22,14,871
Cooch Behar	17,71,643
Dinajpur	1202478
Malda	20,31,871
Murshidabad	36,97,552
Birbhum	20,95,829
Nadia	29,64,253
Burdwan	48,35,388
Bankura	23,74,815
Purulia	18,53,801
Hooghly	35,57,306
North 24 Parganas	55,29,497
South 24 Parganas	43,88,102
Howrah	29,66,861
Medinipur	3371398
West Bengal	5,45,80,647

DISTRICTS	1991
Darjeeling	12,99,919
Jalpaiguri	28,00,543
Cooch Behar	21,71,145
Uttar Dinajpur	1897045
Dakshin Dinajpur	12,30,608
Malda	26,37,032
Murshidabad	47,40,149
Birbhum	25,55,664
Nadia	38,52,097
Burdwan	60,50,605
Bankura	28,05,065
Purulia	22,24,577
Hooghly	43,55,230
North 24 Parganas	72,81,881
South 24 Parganas	57,15,030
Howrah	37,29,644
Medinipur	41,65,956
West Bengal	6,80,77,965

DISTRICTS	2001
Darjeeling	16,09,172
Jalpaiguri	34,01,173
Cooch Behar	24,79,155
Uttar Dinajpur	2441794
Dakshin Dinajpur	1503178
Malda	32,90,468
Murshidabad	58,66,569
Birbhum	30,15,422
Nadia	46,04,827
Burdwan	68,95,514
Bankura	31,92,695
Purulia	25,36,516
Hooghly	50,41,976
North 24 Parganas	89,24,286
South 24 Parganas	69,06,689
Howrah	42,73,099
Purba Medinipur	44,17,377
Paschim Medinipur	51,93,411
West Bengal	8,01,76,197

DISTRICTS	2011
Darjeeling	18,46,823
Jalpaiguri	38,72,846
Cooch Behar	28,19,086
Uttar Dinajpur	3000849
Dakshin Dinajpur	1670931
Malda	39,88,845
Murshidabad	71,03,807
Birbhum	35,02,404
Nadia	51,67,600
Burdwan	77,17,563
Bankura	35,96,674
Purulia	29,30,115
Hooghly	55,19,145
North 24 Parganas	1,00,82,852
South 24 Parganas	81,53,176
Howrah	48,50,029
Purba Medinipur	50,94,238
Paschim Medinipur	59,43,300
West Bengal	9,12,76,115

R-CODE FOR ANALYSIS :

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data=read.csv("C:/Users/USER/Documents/Excel Files/MSc/ANUBHAV.csv",header=TRUE)

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data1

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Rate",ylab="Districts",main="Representation of decennial growth rate(1971-1981) of West Bengal")

barplot(data1$X1981.91~data1$Districts,horiz=TRUE,xlim=c(0,40),xlab="Decennial Growth
Rate",ylab="Districts",main="Representation of decennial growth rate(1981-1991) of West Bengal")

barplot(data1$X1991.01~data1$Districts,horiz=TRUE,xlim=c(0,40),xlab="Decennial Growth
Rate",ylab="Districts",main="Representation of decennial growth rate(1991-2001) of West Bengal")

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Rate",ylab="Districts",main="Representation of decennial growth rate(2001-2011) of West Bengal")

x1=data1$X1971.81

x2=data1$X1981.91

x3=data1$X1991.01

x4=data1$X2001.11

A=cbind(x1,x2,x3,x4)

A

cor(A)
```

```
cor.test(x1,x2,method="pearson")
cor.test(x1,x3,method="pearson")
cor.test(x1,x4,method="pearson")
cor.test(x2,x3,method="pearson")
cor.test(x2,x4,method="pearson")
cor.test(x3,x4,method="pearson”)
```

For Bar Chart:

Microsoft excel → Insert → Chart → 3-D Bar